MORI SEIKI
THE MACHINE TOOL COMPANY

NVX5000

Machining Center

High-Precision,
High-Speed Vertical Machining Center

NVX5060
NVX5080
NVX5100

The birth of the X-class!

The X-class has evolved from our best selling N Series that sold 28,000 units.

The X-class machine is designed as a result of thousands of customers' feedback on the N Series, and offers high quality, high precision and high reliability.

The X-class machine is a next-generation premium machine with the flexibility to meet various needs and worth investment.

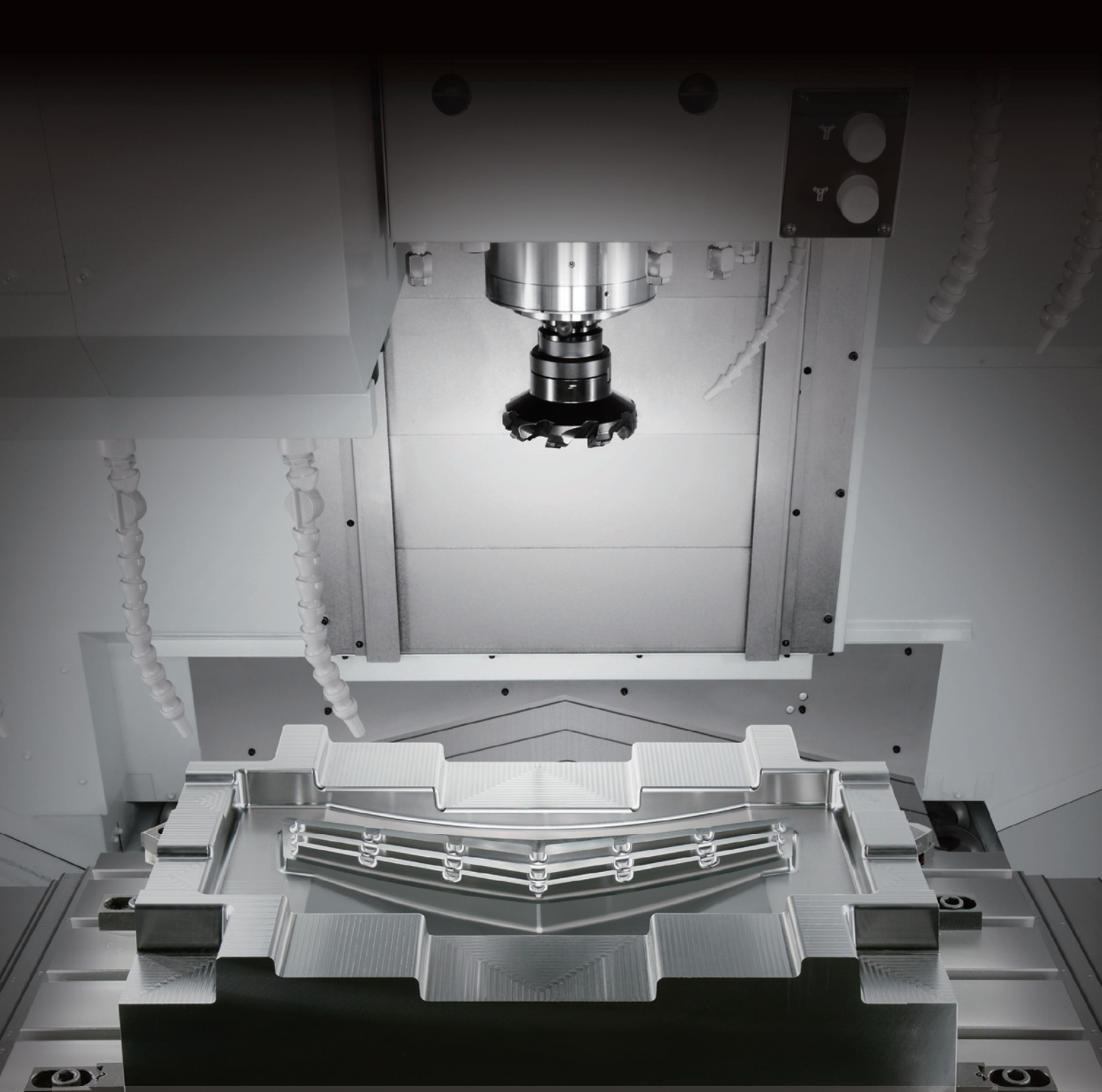
High-Precision,
High-Speed Vertical Machining Center

NVX5060
NVX5080
NVX5100

Compliance with safety standards

The X-class machine complies with safety standards of the respective countries around the world. (CE marking, UL, ANSI and other standards)

CE marking: a conformance display
CE: Communauté Européenne
UL: Underwriters Laboratories Inc.
ANSI: American National Standards Institute



The NVX Series provides unparalleled high-speed, high-precision machining by taking comprehensive measures against thermal displacement, including Mori Seiki's new and original coolant circulation technology and the heat-symmetrical structure that evenly disperses heat in the spindle.

With three machine variations, improved machine rigidity and environmental friendliness, the NVX Series offers excellent performance in every aspect.

CONTENTS

MAPPS: Mori Advanced Programming Production System

● Figures in inches were converted from metric measurements.

Principal mechanisms

Basic structure

By using slideways for all axes, the NVX5000 Series offers improved vibration damping performance and dynamic rigidity. The machine features a wide work envelope and high-speed machining, while maintaining high rigidity.

Travel

NVX5080/40

X-axis 800 mm (31.5 in.)

Y-axis 530 mm (20.9 in.)

Z-axis 510 mm (20.1 in.)

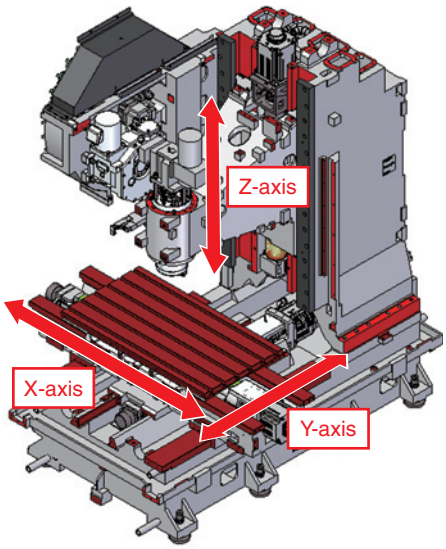
Max. acceleration

NVX5080/40

X-axis 0.73 G
{7.15 m/s² (23.46 ft/s²)}

Y-axis 0.53 G
{5.19 m/s² (17.03 ft/s²)}

Z-axis 0.96 G
{9.41 m/s² (30.87 ft/s²)}



Rapid traverse rate <X, Y and Z axes>

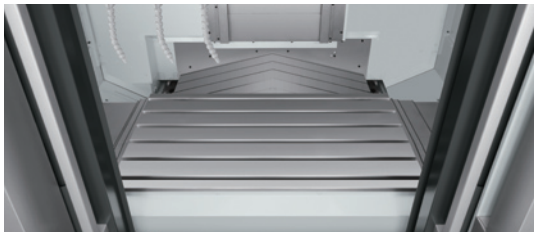
30 m/min (1,181.1 ipm)

Variations

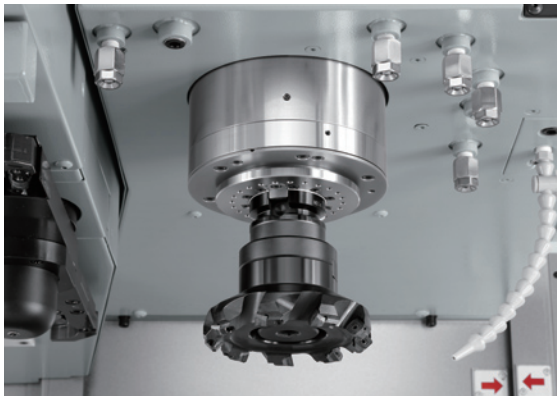
The X-axis travel is available in three variations to suit different workpiece sizes.

X-axis travel

NVX5060/40	NVX5080/40	NVX5100/40
600 mm (23.6 in.)	800 mm (31.5 in.)	1,050 mm (41.3 in.)



Spindle



A spindle with a large-diameter bearing is used to improve rigidity. For the spindle drive, we use the high-efficiency DDS (Direct Drive Spindle) motor which extracts full power over a wide range, from high-speed machining to heavy-duty cutting.

Spindle cooling

The machine uses a spindle in which air and cooling oil pipes are arranged symmetrically relative to the center of the spindle. This heat-symmetrical structure minimizes thermal displacement in the spindle by dispersing heat evenly. We have also taken measures against heat sources, with coolant piping around the spindle and coil end cooling for the motor.

Improved spindle structure

We have enhanced the labyrinth structure to prevent any problems caused by coolant infiltration.

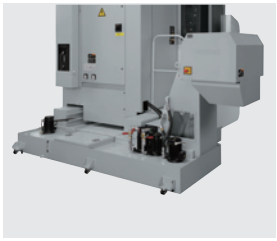
Spindle variations

The NVX Series has three spindle variations to suit your machining needs.

	Standard	High speed OP	High output OP
Max. spindle speed	12,000 min^{-1}	20,000 min^{-1}	8,000 min^{-1}
Spindle drive motor	15/11 kW (20/15 HP) <10%ED/cont>	18.5/15/11 kW (24.7/20/15 HP) <10 min/30 min/cont>	30/22 kW (40/30 HP) <25%ED/cont>

Chip disposal

Chip flush coolant and chip buckets are equipped as standard. The external chip conveyor is also available as an option.



■ Tank capacity

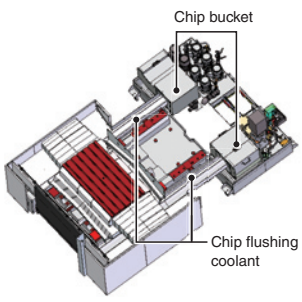
NVX5080:

353 L (93.2 gal.)

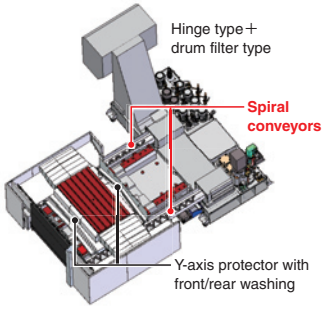
584 L (154.2 gal.) OP

(external chip conveyor specifications)

● For details of the external chip conveyor, please refer to Page 10.



Chip bucket specifications (standard)

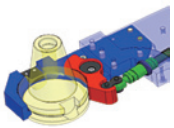


External chip conveyor specifications OP

We recommend the spiral conveyor because a large amount of chips and long chips cannot be discharged by chip flush coolant.

ATC, Magazine

An ATC arm with the self-return function allows safe and high-speed tool change.



When the arm grabs a tool, the holding lever rotates and then the lock bar comes out.

■ Tool changing time

Chip-to-chip

Tool changing time	No. 40 taper	
	ATC standby mode OFF	ATC standby mode ON
Adjacent <DIN>	3.49 sec.	2.98 sec.
Farthest <DIN>	3.49 sec.	2.96 sec.
<MAS>	3.45 sec.	2.98 sec.

Tool-to-tool

No. 40 taper
1.3 sec.

● The time differences are caused by the different conditions (travel distances, etc) for each standard.
● Depending on the arrangement of tools in the magazine, the chip-to-chip time may be longer.
● ATC standby mode: open the ATC shutter using M code commands beforehand.

The machine uses Mori Seiki's original magazine, which has a shutter as standard.

■ Tool storage capacity (No. 40 taper)

30 tools 60 tools OP 90 tools OP

■ Max. tool diameter

Without adjacent tools	With adjacent tools
150 mm (5.9 in.)*	80 mm (3.1 in.)

* High speed (20,000 min^{-1}): 125 mm (4.9 in.)

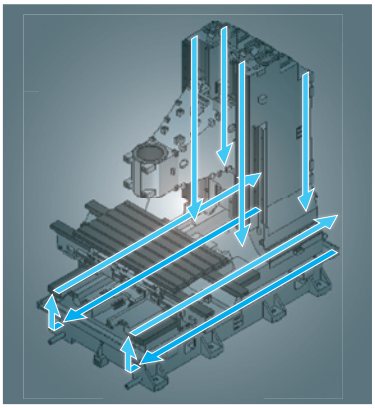
Original technology

Coolant circulation for casting parts OP

Mori Seiki has developed a new technology to circulate coolant through the casting parts as a measure against thermal displacement that directly affects machining accuracy. Thermal displacement is caused by various factors including non-uniform expansion and contraction due to difference in thickness of the casting; uneven heat generation in the slideways; operating environment; and changes in ambient temperature due to season and time of day. The coolant circulation maintains a uniform temperature inside the casting parts, and minimizes deformation in the machine.

■ Effects of coolant circulatio

- **Uniform thermal displacement**
- **Resistance to changes in ambient temperature**
- **High-accuracy long-term machining**



Coolant circulation pathway

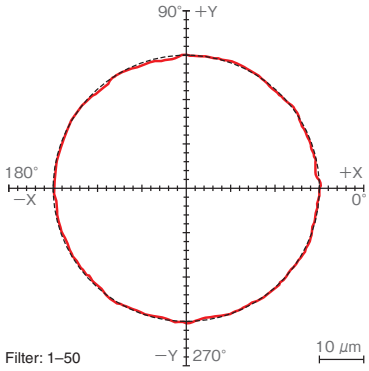
High-precision data

Roundness

NVX5080/40

Material <JIS> : A5052 <outer diameter: 117 mm (4.6 in.)>
Tool : ϕ 16 mm (ϕ 0.6 in.) solid carbide end mill <4 flutes>
Spindle speed : 2,500 min^{-1}
Feedrate : 1,000 mm/min (39.4 ipm)
Depth of cut : 0.1 mm (0.0039 in.)

A5052: Aluminum



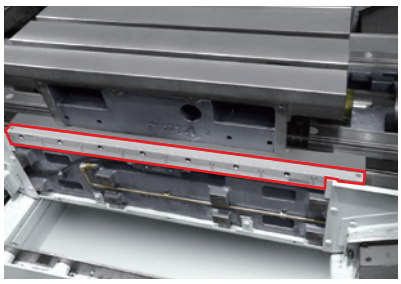
1.98 μm (actual result)

● The cutting test results indicated in this catalog are provided as examples. The results indicated in this catalog may not be obtained due to differences in cutting conditions and environmental conditions during measurement.
JIS: Japanese Industrial Standard

High-precision equipment

Direct scale feedback OP

The absolute magnetic linear scale (full closed-loop control) made by Magnescale is effective for high-precision positioning, and is available as an option. Magnescale



● The photo shows the NV4000 DCG

Resolution
0.01 μm

Coolant cooling system (separate type) OP

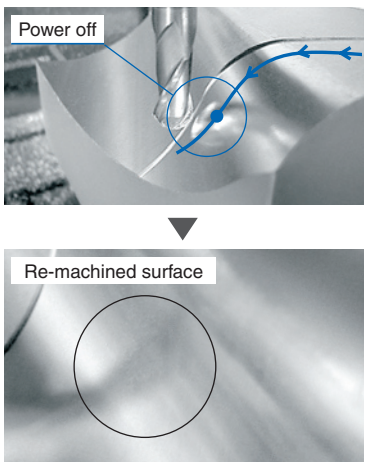
Increase in the oil temperature, which is caused by heat generation during machining or by coolant circulation, greatly affects the dimensional accuracy of the workpieces and thermal displacement in the machines. Please use this unit to prevent the coolant from heating. When using oil-based coolant, the oil temperature can become extremely high even with the standard coolant pump, so please be sure to select this unit.

When using oil-based coolant, please be sure to consult with your Mori Seiki representative.

● While this unit is not the only way to completely control the temperature of the coolant, it makes a major contribution to preventing increases in the oil temperature.

Z-axis drop prevention function ideal for blackouts

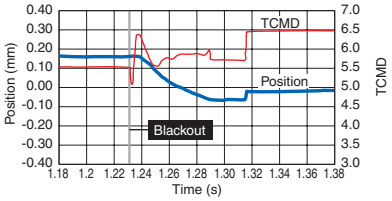
Raising the spindle slightly during blackouts prevents any contact between the tool and the workpiece caused by the spindle dropping.



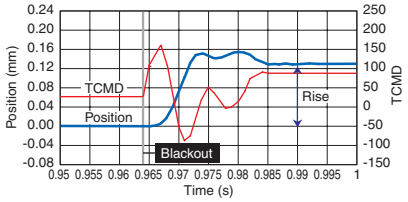
※ The Z-axis drop prevention function is not available in the following situations.

1. When the feed axis servo alarm has gone off.
2. When the power supply module alarm has gone off.
3. When the communication alarm between the CNC and the amp has gone off.

Before blackout countermeasure



After blackout countermeasure (Z-axis raised)



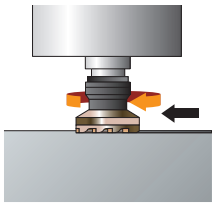
TCMD: Torque command
● Depending on how voltage drops (slowly or suddenly), it may not always be possible to detect a blackout.

Cutting test

The NVX5000 series is suitable for a wide range of machining from heavy-duty cutting of castings to high-speed cutting of aluminum.

NVX5080/40

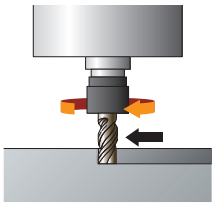
ϕ 80 mm (ϕ 3.1 in.) face mill <7 flutes>



Material <JIS>: S50C

Material removal rate	400 mL/min (24.4 in³./min)
Width of cut	56 mm (2.2 in.)
Depth of cut	3 mm (0.1 in.)
Spindle speed	1,300 min⁻¹
Feedrate	2,380 mm/min (93.7 ipm)

Roughing end mill: ϕ 20 mm (ϕ 0.8 in.) <4 flutes>



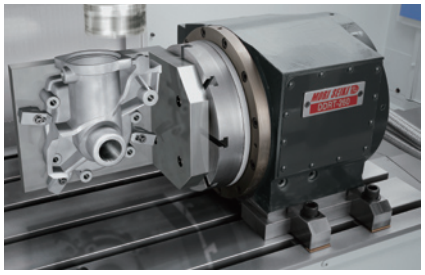
Material <JIS>: S50C

Material removal rate	337 mL/min (20.6 in³./min)
Width of cut	18 mm (0.7 in.)
Depth of cut	20 mm (0.8 in.)
Spindle speed	1,300 min⁻¹
Feedrate	936 mm/min (36.9 ipm)

● The cutting test results indicated in this catalog are provided as examples. The results indicated in this catalog may not be obtained due to differences in cutting conditions and environmental conditions during measurement.
S50C: Carbon steel JIS: Japanese Industrial Standard

4-axis machining

Rotary table DDRT OP



It is possible to equip the machine with the high-speed, high-accuracy DDRT SERIES rotary table which incorporates the DDM (Direct Drive Motor). The high-efficiency machining using 4 axes and high-speed and high-precision indexing realize process integration.

- Equipped with DDM
- Zero backlash
- Achieves high-precision indexing
- Offers stable machining through powerful clamping
- Allows high-efficiency machining using 4 axes

Direct Drive Motor

DDM® Direct Drive Motor

Transmitting the drive power directly to the rotary axes without using gears eliminates backlash. Compared with conventional worm gear systems, this dramatically improves transmission efficiency and offers high-speed feed.

■ Rotational speed of the table

Conventional machine	DDRT-260	Compared with conventional machine
17 min⁻¹	▶ 150 min⁻¹	Approx. 9 times greater

■ Positioning accuracy

Conventional machine	DDRT SERIES	Compared with conventional machine
20 sec.	▶ 5 sec.	4 times greater

■ Machine specifications

			DDRT-200	DDRT-260	DDRT-300
Table diameter		mm (in.)	200 (7.9)	260 (10.2)	300 (11.8)
Center height		mm (in.)	140 (5.5)	160 (6.3)	180 (7.1)
Nose hole diameter		mm (in.)	65 (2.6) H7	75 (3.0) H7	95 (3.7) H7
Through hole diameter		mm (in.)	50 (2.0)	50 (2.0)	50 (2.0)
Clamp system			Air	Air	Air
Drive torque <cont/max.>		N·m (ft·lbf)	60/160 (44.3 /118.0)	105/280 (77.4 /206.5)	180/410 (132.8 /302.4)
Rotational speed of the table		min⁻¹	250	150	120
Repeatability	Unclamped	sec.	2	2	2
Positioning accuracy	Clamped	sec.	5	5	5
	Unclamped	sec.	5	5	5
Mass of machine <rotary table>		kg (lb.)	120 (264)	155 (341)	200 (440)
Maximum work inertia <vertical>		kg·m²	0.45	0.678	1.6
Table loading capacity	Vertical load	kg (lb.)	100 (220)	150 (330)	175 (385)
Maximum thrust load applicable on the table	Clamp torque	N·m (ft·lbf), F×L	800 (590.0)	1,000 (737.6)	1,000 (737.6)
	Moment load	N·m (ft·lbf), F×L	1,500 (1,106.3)	3,000 (2,212.7)	4,000 (2,950.2)

Reduction in environmental burden

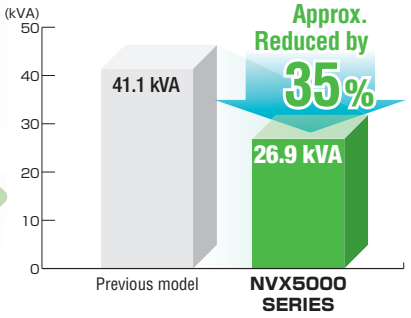
eco friendly

To conserve limited resources and protect global environment.
The NVX Series pursues a high “environmental performance”
that is required of machine tools.

Comparison of power consumption

Change in motor configuration	☞ ▲11.95 kVA
Power-saving function (during standby)	☞ ▲0.18 kVA
LED lighting	☞ ▲5.5 W

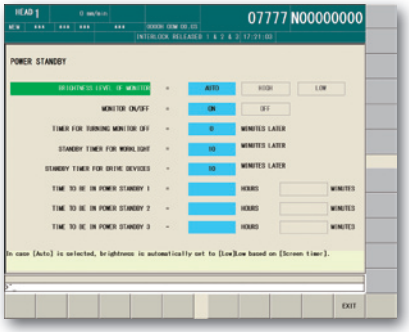
As a result...



The machine achieves approximately 35% reduction in total power consumption by reviewing the motor configuration and improving the power-saving function. It is not only eco-friendly, but also helps reduce your energy costs.

Power-saving function

Power consumption is reduced while operating the machine efficiently.



Automatic machine light function

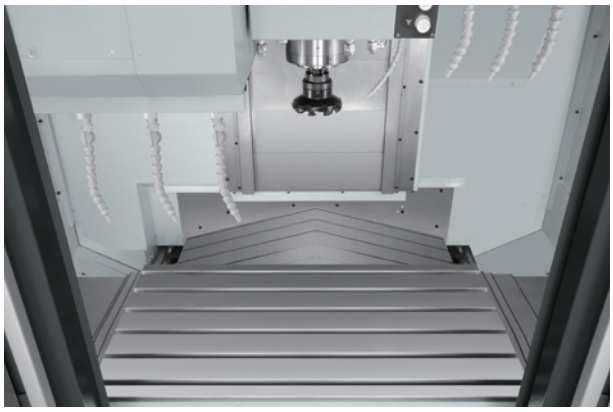
If the operation panel is not touched for a certain amount of time, the interior light automatically turns off. This saves energy and lengthens the life of the machine lights.

Automatic sleep function

If the keyboard is not touched after a certain amount of time and NC operation is not being performed, power is cut off to the servo motor, the spindle, the coolant pump and the chip conveyor, thereby saving energy.

LED lighting

LED with high luminous efficiency offers a high light output at a low wattage, contributing to reducing electricity use.

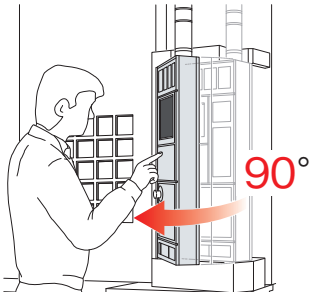


Improved convenience

With an easy-to-access table and openable ceiling, the NVX5000 Series is designed to offer superior operability and ease of setup that are required of vertical machining centers.

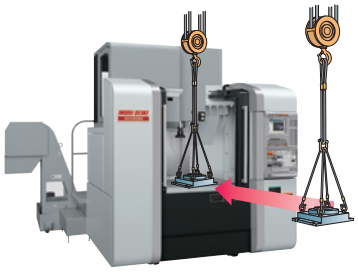
Swivel-type operation panel

The operation panel which can swivel from 0 degree to 90 degrees improves operability and visibility.



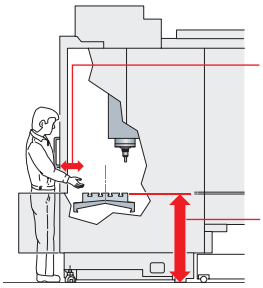
Loading and unloading with a crane

The ceiling part also opens, allowing easy loading and unloading of workpieces using a crane.



Accessibility

With excellent access to the table and a wide door opening, setup operations such as fixture adjustment can be done smoothly.

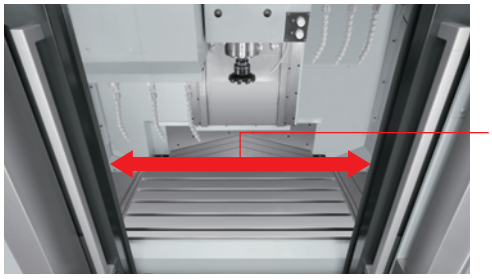


Distance from table

243 mm (9.6 in.)

Height of table top surface

900 mm (35.4 in.)

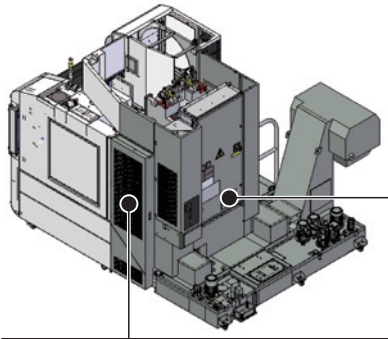


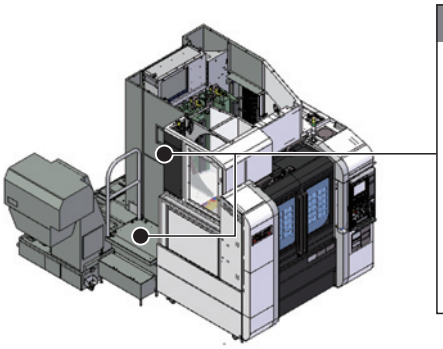
Door opening

920 mm (36.2 in.)

Maintenance

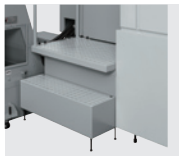
The NVX5000 Series is designed with features for ease of maintenance to increase the machine operating rate.





Improved magazine design

A new magazine has a door and steps for easier operation and maintenance.



Magazine step OP

magazine door OP

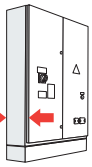
Centralized layout of devices

Devices which need to be inspected every day are gathered together at the side of the machine.

Slimmer electrical cabinet

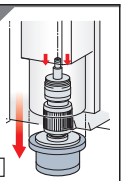
A slim electrical cabinet closes the proximity between you and the insides of the machine during maintenance.

320 mm (12.6 in.) <including doors>



Replacement of spindle unit

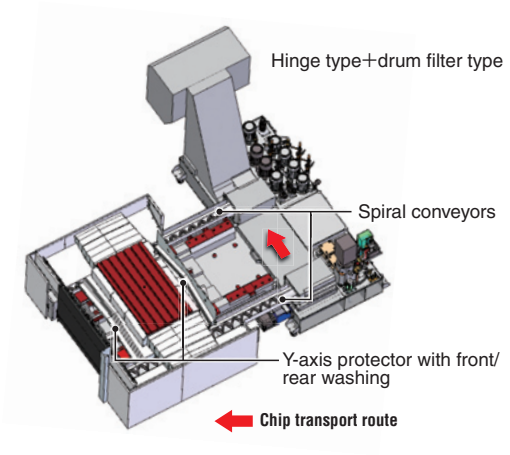
By changing the spindle unit to a cartridge, which even includes the rear bearings, we have dramatically reduced replacement time.



Spindle unit

Peripheral equipment

External chip conveyor OP



Hinge type+drum filter type Recommended

This conveyor can handle various types and length of chips. The built-in drum filter helps to reduce frequency of cleaning the tank.

◎: Ideal ○: Suitable ×: Not suitable

Frequency of cleaning	Specifications	Workpiece material and chip size				
		Steel		Cast iron	Aluminum/non-ferrous metal	
		Long	Short	Short	Long	Short
Low ↓ High	Hinge type+drum filter type Recommended	◎	◎	○	◎	◎
	Magnet scraper type	×	○	◎	×	×
	Hinge type*	○	×	×	○	×

* Short chips may escape into the tank.

- Chip size guidelines Short: chips 50 mm (2.0 in.) or less in length, bundles of chips ϕ 40 mm (ϕ 1.6 in.) or less Long: bigger than the above
- The options table below the general options when using coolant. Changes may be necessary if you are not using coolant, or depending on the amount of coolant, compatibility with machines, or the specifications required.
- Please select a chip conveyor to suit the shape of your chips. When using special or difficult-to-cut material (chip hardness HRC45 or higher), please consult with your Mori Seiki representative.
- Chip conveyors are available in various types for handling chips of different shape and material. For details, please consult with your Mori Seiki representative.

Coolant tank

A high capacity coolant tank comes as a standard feature.

■ Tank capacity

NVX5080:

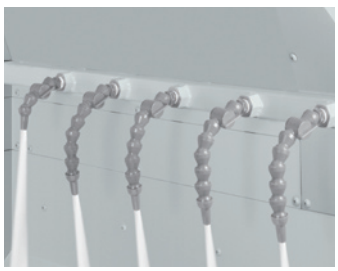
353 L (93.2 gal.)

584 L (154.2 gal.) OP

(external chip conveyor specifications)

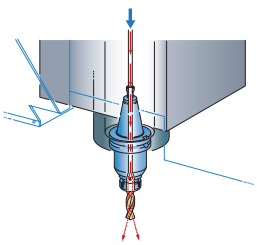
Shower coolant OP

As well as preventing chips from scattering during machining, this allows them to fall smoothly.



Through-spindle coolant system (separate type) OP

The through-spindle coolant system effectively eliminates chips, cooling the machine point, and lengthening the lives of your tools.

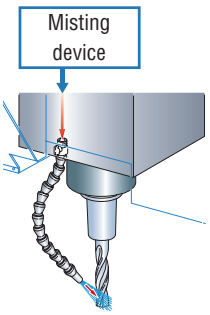


Center through

High-pressure coolant system

Semi dry unit OP

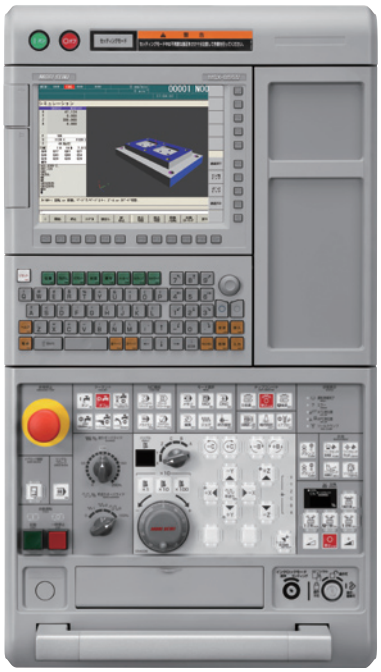
Supplies air and oil mist to the cutting tip. An environmentally friendly device which reduces oil consumption. We recommend using this unit together with a mist collector.



- The colors and configurations shown in the photographs or illustrations may differ from those of the actual product.

MAPPS Ⅳ

A New High-Performance Operating System
for Machining Centers



● 10.4-inch operation panel

A new high-performance operating system that pursues ease of use, and combines the best hardware in the industry with the advanced application/network systems.

- **Outstanding operability thanks to upgraded hardware**
- **Enhanced functionality by using CAM software (option)**
- **New functions for easier setup and maintenance**
- **Machine interior and exterior can be monitored on the screen (option)**

Outstanding operability

Vertical soft-keys

The vertical soft-keys can be used as option buttons or shortcut keys to which you can assign your desired screens and functions, allowing you to quickly display the screen you want.

Keyboard

A PC-type keyboard is used as standard, making key input easy. A keyboard with a conventional key layout is also available as an option.

Advanced hardware

Reduction of drawing time

Shorter drawing time was achieved thanks to increased CPU performance.

Main specifications

Main memory	1 GB
User area	1 GB
Interface	・USB 2.0 3 ports (Screen side: 1, Back of operation panel: 2) ・LAN 2 ports (1000BASE-T) ・Memory card slot
Soft-keys	Right 10 keys Bottom 12 keys

Faster creation of programs

CAM software ESPRIT OP

ESPRIT® allows you to create complex 3D programming with high-added value. By just installing the software on your PC with connection to LAN, you will be able to use it. (Once the software is started on the computer, it can be used for up to 7 days without LAN connection.)

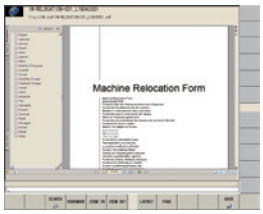
- **Postprocessor as standard**
- **CAM software will be ready to use once your machine is installed**
- **Cost for introducing CAM software can be saved**
- **ESPRIT® data can be modified on the machine**
  (through Remote Desktop connection*)
- **The software can be installed on multiple PCs on the network**
  (It cannot be simultaneously started up on more than one PC)
- **2-year warranty support** (including free update)

* Applicable Operating Systems: Windows Vista Business / Ultimate, Windows 7 Professional / Ultimate
● A PC is required to use ESPRIT®. Please prepare PCs by yourself.

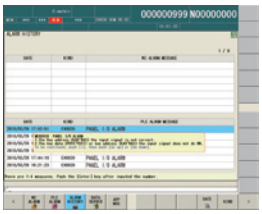
Improved ease of setup and maintenance

MAPPS Ⅳ is packed with new functions for easier setup and maintenance, including the File Display and Memo function that displays operating instructions and manuals on the screen and the Alarm help function that provides instructions when alarms occur.

File display and Memo function



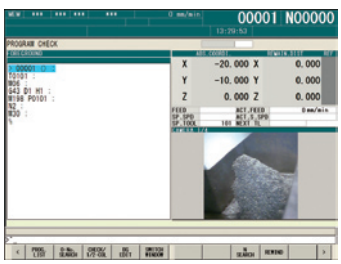
Alarm help function



Improved work efficiency

MAPPS Camera OP Please contact Mori Seiki

Images taken by cameras installed inside/outside the machine can be displayed on the programming screen. This function is useful for maintenance.



Possible camera installation points

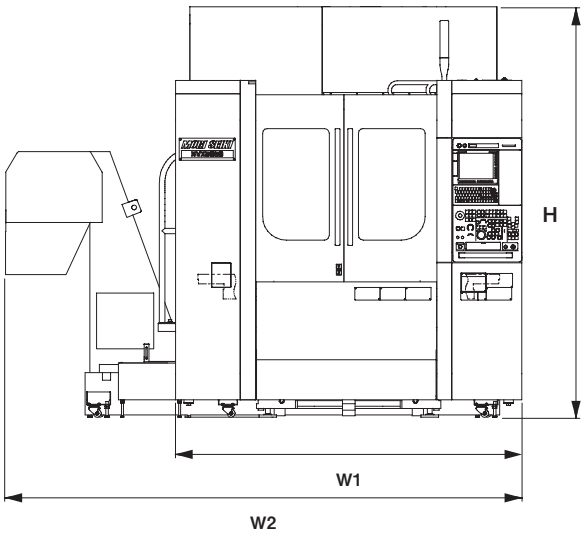
- Inside machine
  (to check machining)
- Chip bucket
  (to check chip accumulation)
- Tool magazine
  (to check cutting tools)
- Other points requested by customers

MAPPS: Mori Advanced Programming Production System

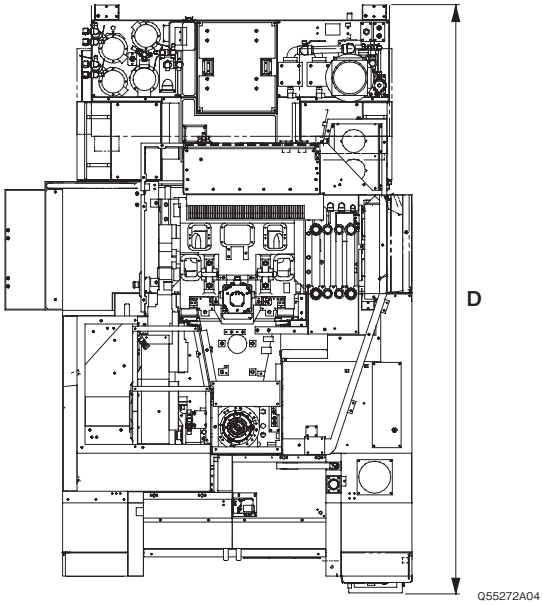
● The photo shown may differ from actual machine.
● Information about the screen is current as of October 2010.

Installation diagrams (NVX5060, NVX5080, NVX5100)

Front view



Plan view



mm(in.)

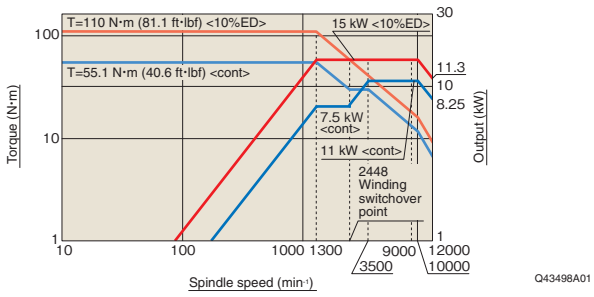
Machine type	Width		Depth	Height
	W1 <Chip bucket specifications>	W2 Hinge type + drum filter type OP	D Machine only/Including chip conveyor	H
NVX5060	2,000 (78.7)	3,071 (120.9)	3,670 (144.5)/3,718 (146.4)	2,597 (102.2)
NVX5080	2,180 (85.8)	3,251 (128.0)	3,670 (144.5)/3,718 (146.4)	2,597 (102.2)
NVX5100	2,740 (107.9)	3,811 (150.0)	3,670 (144.5)/3,718 (146.4)	2,597 (102.2)

Spindle speed torque/output diagrams

NVX5060/40, NVX5080/40, NVX5100/40

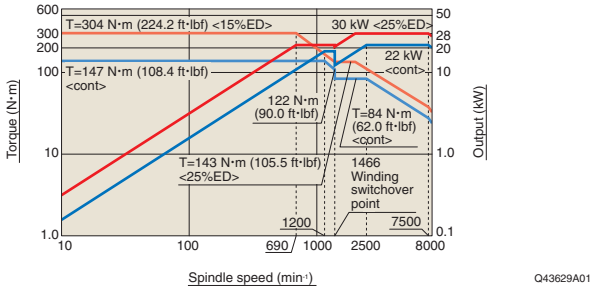
[Standard]

- Max. spindle speed: 12,000 min^{-1}
- Spindle drive motor: 15/11 kW (20/15 HP) <10%ED/cont>



[High output OP]

- Max. spindle speed: 8,000 min^{-1}
- Spindle drive motor: 30/22 kW (40/30 HP) <25%ED/cont>



Standard & optional features

●: Standard features ○: Options

主軸

12,000min^{-1}: 15/11 kW (20/15 HP) <10%ED/cont>		●
20,000 min^{-1}: 18.5/15/11kW (24.7/20/15 HP) <10 min/30min/cont> {high speed}		○
8,000 min^{-1}: 30/22 kW (40/30 HP) <25%ED/cont> {high output}		○
BT40	Dual contact	○
Spindle cooling system	Fan cooler type	●
	Inverter-controlled oil cooler (separate type)	○

Tool magazine

Tool storage capacity	30 tools	●
	60 tools	○
	90 tools	○
ATC shutter		●
Magazine door		○

ATC

Type of tool shank	BT40	●
Type of retention knob	MORI SEIKI 90° type	●

Table

Table	T-slot	●
Sub table	Solid	○
	T-slot	○

Coolant

Coolant system		●
Chip flushing coolant		●
Through-spindle coolant system (unit on coolant tank) center through	1.5 MPa (217.5 psi) <water-soluble>	○
	7.0 MPa (1,015 psi)	○
	Interface {1.5 MPa (217.5 psi) <water-soluble>}	○
	Interface <7.0 MPa (1,015 psi)>	○
Through-spindle coolant system (separate type) center through	Interface <7.0 MPa (1,015 psi)>	○
Through-spindle air specifications (only for air)		○
Coolant cooling system (separate type) for standard coolant system		○
Mist collector interface (duct only)	125 mm (4.9 in.)	○
	150 mm (5.9 in.)	○
	200 mm (7.9 in.)	○
Mist collector (HVS-220), including stand		○
Shower coolant		○
Additional coolant system for tool tip		○
Oil-hole drill coolant system		○
Oil skimmer		○
Semi dry unit (Tanaka Import)		○
Oil shot system		○
Oil mist system		○

Chip disposal

Air blow	Tool tip <when the tool tip air blow is regularly used, air supply of more than 300 L/min (79.2 gpm) is separately required>	●
Coolant gun for machining side		○
Chip conveyor (internal, spiral type) + Chip conveyor interface (external)		○
Chip conveyor (internal, spiral type) + Chip conveyor (external, hinge type + drum filter type)		○
Chip conveyor (internal, spiral type)		○
Chip bucket		○

Measurement

In-machine measuring system (spindle)	Optical type touch sensor OMP60	(R)	○
In-machine measuring system (table)	Touch sensor	(M)	○
	Touch sensor	(R)	○

● The specifications vary depending on the manufacturers.
(R): Made by RENISHAW (M): Made by METROL

Operation support device/function

Auto power off	●
Automatic door	○

Improved accuracy

Direct scale feedback for X, Y, Z-axis	○
Coolant circulation for casting parts	○

Safety features

Full cover	●
Door interlock system <incl. mechanical lock>: front door/setup station door (for APC)	●
Door interlock system: electrical cabinet door	●
Low air pressure detecting switch	●
Residual pressure exhaust valve	●

Others

Built-in worklight (LED)		●
T-nuts for table slots		●
Leveling block		●
Hand tools		●
Signal tower 3 layers		○
Raised column	200 mm (7.9 in.)	○
Angle head		○
Dry anchor		○
Index table interface (M signal output from terminal block)		○
SMC Refrigerating type air dryer		○
Manual pulse generator (separate type)		○
Machine covers disassembled for export shipment		○
Additional in-machine light		○
Additional axis interface		○
Additional axis DDRT		○

● The information in this catalog is valid as of October 2010.
● Specifications, accessories, safety device and function are available upon request.
● Some options are not available in particular regions. For details contact Mori Seiki.

Numerical control unit specifications (MSX-853 Ⅳ)

●: Standard ○: Options

Controlled axes

Controlled axes	X, Y, Z, MG	●
Simultaneously controlled axes	4 axes	●
Least input increment	0.001 mm (0.0001 in.)	●
Max. command value	±99,999.999 mm (9,999.9999 in.)	●
Inch/metric conversion	G20/G21	●
Machine lock		●
Overtravel		●
Door interlock		●
Stored stroke check 1, 2		●
Load monitor function C	Soft key type	●
Programming resolution multiplied by 1/10	3 axes (X, Y, Z)	○

Operation

DNC operation by the memory card		○
Sequence number comparison and stop		○
Program restart		○
Dry run		●
Single block		●
Jog feed	0－5,000 mm/min (0－197.0 ipm) <20 steps>	●
Manual reference position return		●
Pulse handle feed	Manual pulse generator: 1 unit ×1, ×10, ×100 (per pulse)	●
Manual handle feed	×1, ×10, ×100	●
Z-axis neglect		●
Manual handle interruption		○
1 GB Program storage area (for card DNC operation function, for data backup) <MAPPS>	Files up to 10 MB in size can be edited	●
Synchronous peck tapping		○

Interpolation functions

Nano interpolation		●
Positioning	G00	●
Single direction positioning		●
Exact stop mode	G61	●
Tapping mode	G63	●
Cutting mode	G64	●
Exact stop	G09	●
Helical interpolation	Optional 2 axes and other 1 axis	●
Reference position return	G28	●
Reference position return check	G27	●
Return from reference position	G29	●
2nd reference position return	G30 (used for ATC/APC)	●
Computer link B		○
Cylindrical interpolation	G7.1	○
Installation of high-speed skip terminal		○
Spiral/conical interpolation		○
Threading, synchronous cutting/Feed per revolution		○
Tool spindle Cs control (Cs contour control＋normal direction control)		○

Feed functions

Rapid traverse rate	Max. 60,000 mm/min (2,362.2 ipm)	●
Cutting feedrate	1－5,000 mm/min (0.01－196.9 ipm)	●
Rapid traverse override	F0/1/10/25/100%	●
Feed per minute		●
Tangential speed constant control		●
Cutting feedrate clamp		●
Automatic acceleration/deceleration	Linear type (rapid traverse)/ Exponential function type (cutting feed)	●
Feedrate override	0–200% (10% increments)	●
Override cancel		●
Linear acceleration/deceleration after cutting feed interpolation		●
High accuracy control (look-ahead control)		●
Inverse time feed		○
High-speed and high accuracy control Ⅰ (AI contour control)		○
High-speed and high accuracy control Ⅱ (high-precision contour control)		○

Program input

Optional block skip		●
Max. command value	±8 digits	●
Program number	4 digits (For an 8 digit program number, a sequence change is necessary)	●
Absolute/incremental programming	G90/G91	●
Decimal point programming	Decimal point programming or electronic calculator type decimal point programming can be set using parameters	●
Diameter/radius programming		●
Plane selection	G17, G18, G19	●
Rotary axis designation		●
Rotary axis roll-over		●
Coordinate system setting	G92	●
Automatic coordinate system setting		●
Workpiece coordinate system	G52－59	●
Programmable data input	G10	●
Optional chamfering/corner R		○
Sub-program call	Up to 8 nestings	●
Custom macro		●
Hole machining canned cycle	G80－89	●
Programmable mirror image		●
Addition of optional block skip	Soft key type (2－9)	○
Polar coordinate command		○
Workpiece coordinate system preset		○
Custom macro common variables <in total>	300 variables (#100 to #199, #500 to #699)	○
	600 variables (#100 to #199, #500 to #999)	○
Interruption type custom macro		○
Scaling	G50/G51	○
Coordinate system rotation	G68/G69	○
Additional workpiece coordinate systems	48 sets	○
MORI-POST advanced mode <MAPPS>		○
DXF import function <MAPPS>		○
Islands, open pockets <MAPPS>		○
Text engraving function <MAPPS>		○

Miscellaneous function/Spindle speed function

Miscellaneous function (M function)	4-digit M code	●
Auxiliary function lock		●
Spindle speed function (S function)	5-digit S code	●
Spindle speed override	50－150% (10% increments)	●
Spindle orientation		●
Synchronous tapping		●

Tool offset

Tool function (T function)	8-digit T code	●
Number of tool offsets	200 sets (diameter＋length=1 set, number of offsets indicates that diameter and length are displayed separately)	●
Tool offset memory C	D/H code, geometry/wear	●
Tool length offset	G43, G44, G49	●
Cutter radius offset	G40－G42	●
Tool length measurement		○
Tool position offset	G45－G48	○
MAPPS tool management system		●
MAPPS tool management system＋ Tool IC (MAPPS software only)*		○
MAPPS tool management system＋ Tool ID (MAPPS software only)*		○

*Separate consultation is required if hardware and software are customized.

Mechanical accuracy compensation

Backlash compensation	±9,999.99 pulses	●
Rapid traverse/cutting feed backlash compensation		●
Stored pitch error compensation		●
Interpolation type pitch error compensation		○

Editing

Part program storage length <in total>/ Registerable programs <in total>	125 kB/200 programs	●
	230 kB/400 programs	○
	500 kB/1,000 programs	○
	1,000 kB/1,000 programs	○
	2,000 kB/1,000 programs	○
Part program storage length <in total>＋ Registerable programs <in total>	2,560 m (8,400 ft) <1 MB>＋1,000 programs	○
	5,120 m (16,800 ft) <2 MB>＋1,000 programs	○
Part program edit	Deletion, insertion, and alteration	●
Program protect		●
Background editing		●
Undo/Redo function <MAPPS>		●
Line number display <MAPPS>		●

Operation and display

Status display		●
Clock function		●
Current position display		●
Program comment display	48 characters	●
Parameter setting display		●
Alarm display		●
Alarm history display		●
Operator's message history display		●
Operation history display		●
Running time/Parts count display		●
Actual cutting feedrate display		●
Operating monitor screen	Load meter display etc.	●
Help function		●
Self-diagnosis	Includes alarm display, I/O signal diagnosis and ladder diagram	●
Operation panel: display section	10.4-inch TFT color LCD	●
Multi-counter display <MAPPS>		○

I/O functions and units

Memory card input/output		●
I/O interface	USB	●
	RS-232-C	○
Data server (excluding memory card)		○
Fast data server	100BASE-TX	○
Memory card for data server		○
Data server＋memory card for data server		○
Memory card for MAPPS	CF card (2 GB/512 MB) ＋ATA card	○

● The information in this catalog is valid as of September 2010.

I95042A01

Machine specifications

Item				NVX5060/40	NVX5080/40	NVX5100/40
Travel	X-axis travel <longitudinal movement of table>		mm (in.)	600 (23.6)	800 (31.5)	1,050 (41.3)
	Y-axis travel <cross movement of saddle>		mm (in.)	530 (20.9)		
	Z-axis travel <vertical movement of spindle head>		mm (in.)	510 (20.1)		
	Distance from table surface to spindle gauge plane		mm (in.)	150—660 (5.9—26.0)		
Table	Distance from table surface to floor surface		mm (in.)	900 (35.4)		
	Working surface		mm (in.)	900×600 (35.4×23.6)	1,100×600 (43.3×23.6)	1,350×600 (53.1×23.6)
	Table loading capacity		kg (lb.)	800 (1,760)	1,000 (2,200)	1,200 (2,640)
	Table surface configuration <T slots width×pitch×No. of T slots>			18 mm×100 mm×6 (0.7 in.×3.9 in.×6)		
Spindle	Max. spindle speed		min^{-1}	12,000 [8,000] [20,000]		
	Number of spindle speed ranges			1		
	Type of spindle taper hole			No. 40		
	Spindle bearing inner diameter		mm (in.)	80 (3.1) <12,000 min^{-1} specifications, 8,000 min^{-1} specifications>		
Feedrate	Rapid traverse rate		mm/min (ipm)	X, Y, Z: 30,000 (1,181.1)		
	Feedrate		mm/min (ipm)	1—30,000 (0.01—1,181.1) <when using look-ahead control>		
	Jog feedrate		mm/min (ipm)	0—5,000 (0—197.0) <20 steps>		
ATC	Type of tool shank			BT40 [CAT40] [DIN40] [HSK-63A]		
	Type of retention knob			MORI SEIKI 90° type [45° (MAS-Ⅰ)] [60° (MAS-Ⅱ)] [DIN] [HSK]		
	Tool storage capacity			30 [60] [90]		
	Max. tool diameter	With adjacent tools	mm (in.)	80 (3.1)		
		Without adjacent tools	mm (in.)	150 (5.9) [125 (4.9) <high speed>]		
	Max. tool length		mm (in.)	300 (11.8)		
	Max. tool mass		kg (lb.)	8 (17.6) [12 (26.4)]		
	Method of tool selection			Technical memory random		
	Tool changing time ● The time differences are caused by the different conditions (travel distances, etc) for each standard. ● Depending on the arrangement of tools in the magazine, the chip-to-chip time may be longer.	Tool-to-tool	s	1.3		
		Chip-to-chip (ATC standby mode OFF) <DIN>	s	Adjacent: 3.49 Farthest: 3.49		
		Chip-to-chip (ATC standby mode OFF) <MAS>	s	3.45		
		Chip-to-chip (ATC standby mode) <DIN>	s	Adjacent: 2.98 Farthest: 2.96		
		Chip-to-chip (ATC standby mode) <MAS>	s	2.98 (ATC standby mode: Open the ATC shutter using M code commands beforehand.)		
Motor	Spindle drive motor	12,000 min^{-1}	kW (HP)	15/11(20/15) <10%ED/cont>		
		[8,000 min^{-1}]	kW (HP)	30/22 (40/30) <25%ED/cont>		
		[20,000 min^{-1}]	kW (HP)	18.5/15/11 (24.7/20/15) <10 min/30 min/cont>		
	Feed motor		kW (HP)	X, Y: 3.0 (4) Z: 4.5 (6)		
	Coolant pump motor <50/60 Hz>		kW (HP)	0.73×2/1.21×2 (1.0×2/1.6×2)		
Power sources <standard>	Electrical power supply <cont>		I94293EA01 kVA	27.5		
	Compressed air supply		MPa (psi), L/min (gpm)	0.5 (72.5), 200 (52.8) <ANR>		
Tank capacity	Coolant tank capacity		L (gal.)	320 (84.5) [535 (141.2)*]	353 (93.2) [584 (154.2)*]	443 (117.0) [734 (193.8)*]
Machine size	Machine height		mm (in.)	2,597 (102.2)		
	Floor space <width×depth>		mm (in.)	2,000×3,670 (78.7×144.5) [3,071×3,718 (120.9×146.4)*]	2,180×3,670 (85.8×144.5) [3,251×3,718 (128.0×146.4)*]	2,740×3,670 (107.9×144.5) [3,811×3,718 (150.0×146.4)*]
	Mass of machine		kg (lb.)	6,000 (13,200)	6,350 (13,970)	7,000 (15,400)

[ ]Option

＊External chip conveyor specifications

- Max. spindle speed: depending on restrictions imposed by the workpiece clamping device, fixture and tool used, it may not be possible to rotate at the maximum spindle speed.
- Please use a flange tool when cutting at 15,000 min^{-1} or higher.
- ANR: ANR refers to a standard atmospheric state; i. e., temperature at 20 °C (68 °F), absolute pressure at 101.3 kPa (14.7 psi) and relative humidity at 65%.
- Power sources, machine size: the actual values may differ from those specified in the catalogue, depending on the optional features and peripheral equipment.
- Compressed air supply: please be sure to supply clean compressed air <air pressure: 0.7 MPa (101.5 psi), pressure dew point: 10 °C (50 °F) or below>.
- A criterion capacity to select a compressor is 90 L/min (23.8 gpm) per 0.75 kW (1 HP).
  However, this figure may differ depending on the type of compressors and options attached. For details, please check the compressor specifications.

MORI SEIKI
THE MACHINE TOOL COMPANY

2-year warranty, twice the peace of mind.

Subject to limitations, Mori Seiki machines ordered after April 1, 2007 now have a 2-year warranty.
Please contact your sales representative for details.

2 years Guaranteed peace of mind

- For machines delivered outside of Japan, parts relating to machine breakdown will be guaranteed free for 2 years from the date of installation, and labor costs to repair will be free for 1 year.

<Precautions for Machine Relocation>

EXPORTATION: All contracts are subject to export permit by the Government of Japan. Customer shall comply with the laws and regulations of the exporting country governing the exportation or re-exportation of the Equipment, including but not limited to the Export Administration Regulations. The Equipment is subject to export restrictions imposed by Japan and other exporting countries and the Customer will not export or permit the export of the Equipment anywhere outside the exporting country without proper government authorization. To prevent the illegal diversion of the Equipment to individuals or nations that threaten international security, it may include a "Relocation Machine Security Function" that automatically disables the Equipment if it is moved following installation. If the Equipment is so-disabled, it can only be re-enabled by contacting Mori Seiki or its distributor representative. Mori Seiki and its distributor representative may refuse to re-enable the Equipment if it determines that doing so would be an unauthorized export of technology or otherwise violates applicable export restrictions. Mori Seiki and its distributor representative shall have no obligation to re-enable such Equipment. Mori Seiki and its distributor representative shall have no liability (including for lost profits or business interruption or under the limited service warranty included herein) as a result of the Equipment being disabled.

- If you have any questions regarding the content, contact your nearest Mori Seiki distributor or Technical Center.
- The information in this catalog is valid as of October 2010. Designs and specifications are subject to changes without notice.
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NVX5000-EA01-1D
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